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VARIABILITY OF REACTION-TIME.

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In an examination of the literature on reaction-time, for the purpose of discovering the relation of average reaction-time to variability, and of both to the quality and intensity of the stimulus and the other conditions which determine the time and constancy of reaction, I have been surprised to find that little attention has been given by most investigators to the variability of their results. The early investigations in this field were made, it would appear, for the sole purpose of determining the absolute time of certain mental processes. And this is not strange in view of the fact that until the astronomers proved the existence of the 'personal equation' mental processes were thought to be too quick for measurement. Psychologists therefore came to problems of the time relations of mental processes with special interest in the duration of the psychic state, and practically no interest in the constancy of reactions. An historical survey shows that investigators were content, early in the development of this line of work, with the presentation of the average reaction-times of their series; no mention was made usually of the range of variability, or of the constancy of the reactions. Somewhat later it became the custom to state the extremes between which a series of reaction-times varied, the range; and it is now common to find the average deviation of results, as well as the average reaction-time, in papers on this subject. In only one paper, that of Jenkins and Carlson on the

nerve impulse in molluscs,[1] have I found the *Standard Deviation* used as a measure of variability.

Inasmuch as *variability*, or the degree of constancy with which a reaction occurs is, for certain purposes, of equal value with the average reaction-time, it is strange that it has not received more attention. Wherever comparisons of results are to be made it is necessary to take into account the variability as well as the time of reaction; hence, from comparative physiology and psychology comes the demand for the uniform determination of such a statistical quantity for the measurement of the constancy of reaction as will be most serviceable.

This paper has been written for the purpose of calling attention (1) to the importance of variability in reaction-time statistics; (2) to the need of choosing statistical methods in accordance with the nature of the materials in hand, and the demands of the problems; (3) to the desirability of more general use of curves of distribution; (4) to the preëminent importance of *relative variability*, or the coefficient of variability, for comparative reaction-time studies, and finally (5) to the use of *equality of variability* as a basis of comparison in case of reactions to different modes of stimulation.

Methods of Dealing with Reaction-time Data.

In any study of reaction-time it is usually desirable, and often necessary, to make the following determinations: (1) The *curve of distribution*, which indicates the general form of distribution, the variability, and, if such there be, the existence of types; (2) the *median*;[2] (3) the *mean* or average reaction-time and its probable error. Since for reaction-time there is a lower, but no upper limit, the mean is almost always larger than the median or mode,[3] unless the range has been artificially limited.

[1] *American Journal of Physiology*, Vol. 8, 1903, p. 256.

[2] For definitions of these statistical terms, and discussions of methods employed in connection with vital statistics, see: Brewster, *Proc. Amer. Acad. Arts and Sci.*, Vol. 32, pp. 269–280; Davenport, *Statistical Methods*, New York, 1899; Duncker, *Arch. f. Entwicklungs-Mechanik*, Bd. 8, S. 112–183; Pearson, *Phil. Trans. Roy. Soc. London*, Vol. 185, pp. 71–110; Vol. 186, pp. 343–414; Vol. 187, pp. 253–318; Galton, *Proc. Roy. Soc. London*, Vol. 29, pp. 365–367; Thorndike, *Educational Psychology*, New York, 1903.

[3] The *mode*, if defined as 'the most frequented class,' is not reliable in case of a small number of observations. On this point see Yule, *Jour. Roy. Statistical Soc.*, Vol. 59, p. 398, and Pearson, *Biometrica*, Vol. 1, pp. 260–261.

(4) The *range* of the series; (5) the *standard deviation* and its probable error. The latter is more satisfactory on the whole than the average deviation, which thus far has been used almost exclusively in reaction-time statistics, because of its greater sensitivity to departures from the mean, and its applicability to forms of distribution whose variability cannot be accurately measured by the method of average deviation; finally, (6) the *coefficient of variation* should never be omitted.

The Importance of Relative Variability.

As I have already pointed out in connection with discussions of the time relations of the reactions of the medusa,[1] reaction-times can not be profitably compared with respect to their variability unless they are reduced to some common measure. The obvious reason for this is thus stated by Davenport[2]: "The relative size of the average deviation of two organs depends very largely upon the relative size of these organs. When the mean dimension is large, we expect a greater deviation than when it is small. Thus the average deviation of the stature of adult British males from the mean is about 2 inches. An average deviation of 2 inches in the length of the nose, in any race, would clearly indicate a much greater variability in the nose length than in the stature. In comparing the variability of two such diverse measures as stature and nose length, it is better to compare the ratios of the average deviation to the mean dimension. Thus, since the mean stature of adult British males may be taken at 67 inches, variability in stature may be expressed by the ratio $2/67 = .02985$. This number indicates that the average deviation from the mean stature is about three one-hundredths of the mean stature; which is clearly more important than to say that it is two inches." More recently Myers[3] has emphasized the importance of this fact in connection with reaction-time statistics. What he calls the *variation-coefficient* expresses, as he says,

[1] *American Journal of Physiology*, Vol. 9, pp. 291, 292, and *Biological Bulletin*, Vol. 6, pp. 92–95.

[2] This statement by Davenport occurs in a paper of Brewster's in *Proc. Amer. Acad. Arts and Sciences*, Vol. 32, p. 272 (footnote).

[3] *Report of the Cambridge Anthropological Expedition*, Vol. II., Pt. II., p. 212.

"the ratio between the mean variation and the average (reaction-time). It is obtained by the formula $v.c. = \frac{m.v. \times 100}{av.}$. Its importance lies in the fact that the mean variation depends not merely on the fluctuations of the individual data from the average, but also on the actual magnitude of that average, varying directly with its value. Thus if a reagent, whose average reaction-time to an auditory stimulus is 120$^{\sigma}$, shew a mean variation of 10$^{\sigma}$, and if, reacting to a visual stimulus, his average reaction-

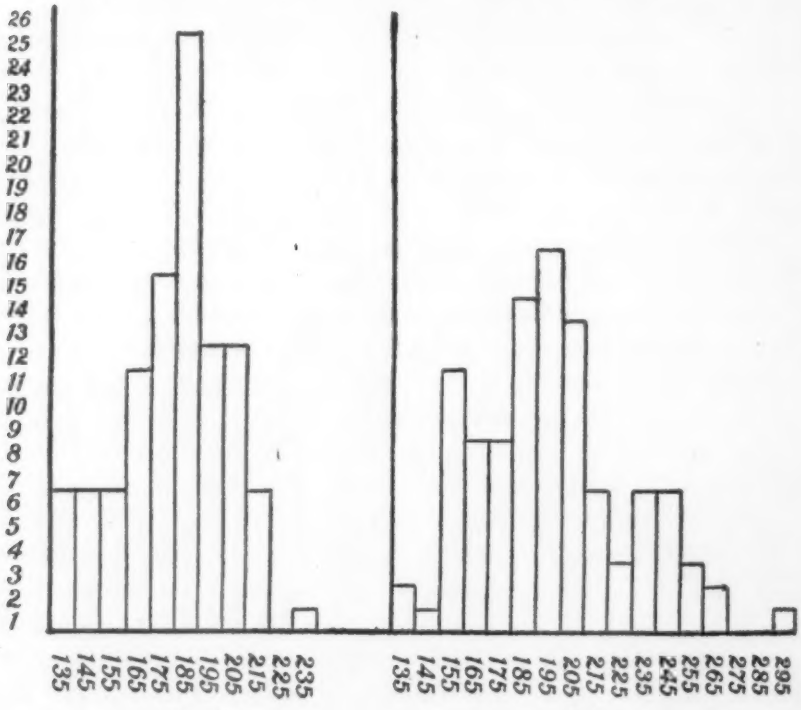

FIG. 1. FIG. 2.

FIG. 1. Reaction-Time of Frog to Electrical Stimulation.

FIG. 2. Reaction-Time of Frog to Electrical Stimulation in the Presence of a Visual Stimulus.

time be 180$^{\sigma}$ and his mean variation be 15$^{\sigma}$, he is reacting with an equal degree of constancy in each case, although the absolute values of the mean variation are not the same." Myers' *variation-coefficient* is determined by the use of the *average de-*

viation (*m. v.*). Pearson[1] has taken 'as a measure of variation the ratio of *standard deviation* to mean, or what is more convenient, this quantity multiplied by 100,' and has designated it the *coefficient of variation*. In order to avoid the confusion which will inevitably arise if Myers' term as well as Pearson's is retained I have called the ratio of average deviation to mean the *relative variability* (*r. v.*).

To illustrate the application of the methods which have been considered the following series of reaction-times of the frog are presented: (1) A group of one hundred reaction-times to electrical stimulation of the skin. The curve of distribution (more accurately speaking, the polygons) of these is marked Fig. 1; (2) A group of one hundred reaction-times to the same electrical stimulus, when it was preceded for two seconds by a visual stimulus (electric light). The distribution of these is represented by Fig. 2. In the plottings of distribution the numbers below the base line indicate the classes. Thus, 135 is the class containing all reaction-times between 130^{σ} and 139^{σ}. The column of numbers on the left margin indicates the number of reactions in each class.

These two figures show at once that the reaction-time is shorter and less variable when the electrical stimulus is not preceded by the visual stimulus. The quantities determined for the data are as follows:

	VALUES FOR FIGURE 1.	VALUES FOR FIGURE 2.
Median	182.40^{σ}	193.75^{σ}
Mean	$180.00 \pm 1.467^{\sigma}$	$196.50 \pm 2.026^{\sigma}$
Mode	185.00^{σ}	195.00^{σ}
Standard deviation	$21.75 \pm 1.039^{\sigma}$	$30.03 \pm 1.434^{\sigma}$
Average deviation	17.40^{σ}	24.00^{σ}
Coefficient of variation	12.08	15.28
Relative variability	9.66	12.62

Any or all of these values might be useful in a study of the significance of the series of reaction-times under consideration.

The Relation of Reaction-Time to Variability for Different Modes and Intensities of Stimulation.

What is the relation of time of reaction to intensity of stimulus? Does absolute variability (either average or standard)

[1] *Phil. Trans. Roy. Soc. London*, Vol. 187 A, p. 277.

regularly decrease with increase in stimulus intensity? Is relative variability a constant, or does it change with change in the stimulus intensity? For the purpose of obtaining data which would enable me to answer these questions I have examined the results of several investigations which were made primarily for the determination of the relation of reaction-time to stimulus intensity. Since in some of the reports only the mean and the average deviation were given, it has been necessary for me to make use of average deviation and relative

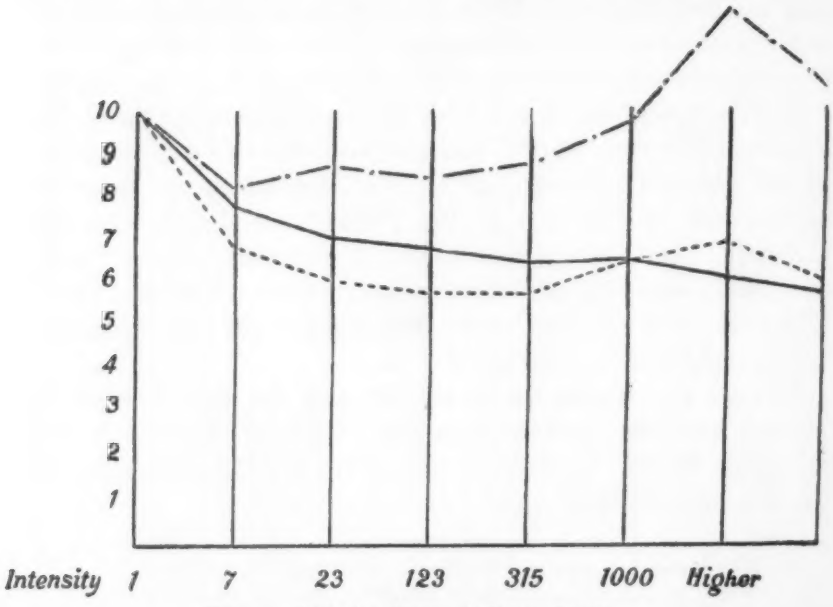

FIG. 3. Reaction-Time of Man to Light.

variability instead of standard deviation and the coefficient of variation, the use of which has been urged earlier in this paper.

In figures 3 to 6, plottings of the values of the average reaction-time (mean), average deviation, and relative variability for different intensities of various stimuli are presented in such a way that the relations of these three quantities to one another, and of each to the stimulus intensity, are exhibited. In each of the figures the solid line represents the mean reaction-time, the dotted line the average deviation, and the broken line the relative variability. For the first or lowest intensity of each mode of

stimulation the value of the three quantities (*m.*, *a. d.* and *r. v.*), taken as 100 per cent., is represented at 10 on the first vertical line, and all other values are expressed in percentage terms of this. Below the base line the intensity values of the stimuli are given.

In Fig. 3 we have the results of Berger's [1] and Cattell's [2] investigation of the relations of man's reaction-time to light to the intensity of the stimulus. Eight intensities were tried, and the result, as is indicated by the solid line of the figure, was a gradual decrease in the time of reaction as the intensity of the

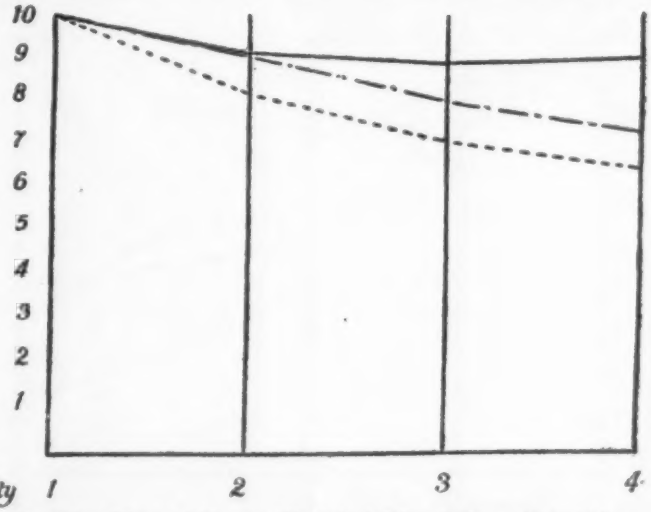

FIG. 4. Reaction-Time of Man to Electrical Stimulation of the Skin.

stimulus increased. At first the average deviation also decreased, but for the last three intensities it shows, instead, an increase. The relative variability, the curve for which is plotted from determinations made by the writer, shows no uniformity in direction of change; it is considerably greater for the strongest stimulus than for the weakest.

Fig. 4 represents the results obtained by Berger [3] in his study of the reaction-time of man to different intensities of electrical stimulation of the skin. In general there is decrease in time of

[1] *Philosophische Studien*, Bd. 3, S. 63.
[2] *Brain*, Vol. 8, p. 513.
[3] *Philosophische Studien*, Bd. 3, S. 64.

reaction with increase in stimulus intensity, and there is steady and marked decrease in both absolute and relative variability.

Reaction-time studies on the frog [1] furnish the data for the curves of Fig. 5. Above the figure the numerical values of the mean reaction-time (*m.*), average deviation (*a. d.*) and relative variability (*r. v.*) for each intensity of the stimulus are presented. In this case too there is a uniform decrease in reaction-time and variability as the intensity of the stimulus increases.

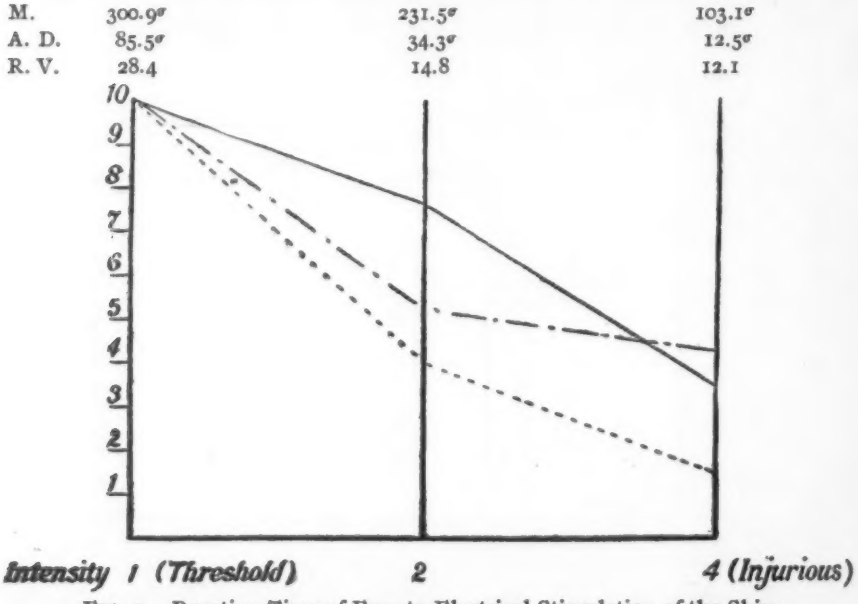

FIG. 5. Reaction-Time of Frog to Electrical Stimulation of the Skin.

Fig. 6 is based upon the results of the writer's [2] study of the reaction-time of the medusa *Gonionemus murbachii* to different intensities of light.

In view of the general indications of these curves it is safe to conclude that, within limits, reaction-time, absolute variability and relative variability decrease with increase in stimulus intensity. Those organisms which react quickest, react also with the greatest degree of constancy. We are not justified, however, in concluding from the results herein presented that

[1] *Harvard Psychological Studies*, Vol. I., pp. 616-617. (PSYCHOLOGICAL REVIEW, *Monograph Supplements*, Vol. 4.)

[2] *Amer. Jour. Physiol.*, Vol. 9, p. 291.

for every mode of stimulation it is possible, by gradually increasing the intensity of the stimulus, to pass from the deliberate voluntary type of reaction to the quick and almost invariable reflex. Only within limits, which must be determined experimentally for each mode of stimulation, for each individual, and for each race, do reaction-time, average and relative variability decrease with increase in intensity of the stimulus.

From the facts already established it follows that by properly choosing the intensity of stimulation any reaction-time or degree

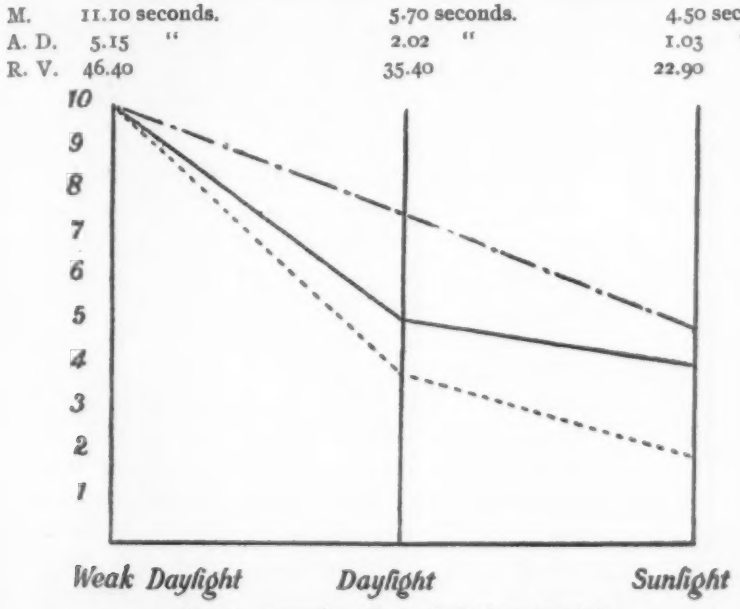

FIG. 6. Reaction-Time of Medusa to Light.

of variability, within a certain range, can be obtained in response to a given mode of stimulation. The conclusion is therefore forced upon us that comparison of reaction-times for different qualities or intensities of stimulation, different individuals and different species can be made profitably only when account is taken of the relation of the time of reaction to its constancy. At present we say, conventionally, that the visual reaction-time is on the whole longer than the auditory, or that tactual is shorter than visual, but there is no scientific basis for the statement, inasmuch as no attention has been given to the

relative intensities of the stimuli. Now, experiments show that intensities of visual and tactual stimuli, for example, may be found whose reaction-times are equally variable; and, since intensity of stimulus is one of the most important determinants of variability, we may assume that those intensities of different modes of stimulation are directly comparable, so far as their reaction-times are concerned, for which the relative variability is the same. It is to be noted, however, that equality in variability as a basis for the comparison of the reaction-times to different modes of stimulation or of different organisms is primarily a postulate. But inasmuch as we have no method of determining the value of one stimulus in terms of another, I propose to call those intensities of two modes of stimulation equivalent whose reaction-times are equally variable, and to test the value of the postulate by treating experimental results in the light of it.

PSYCHOLOGICAL LITERATURE.

CHILD PSYCHOLOGY.

Das Seelenleben des Kindes. Ausgewählte Vorlesungen von KARL GROOS. Berlin, 1904.

Groos develops his subject, in brief, as follows: He first states the current notions as to the methods and aim of child psychology, after which he takes up the classification of mental phenomena. He refers to the traditional tripartite classification popular since Kant, to the bipartite classifications of Brentano and Höfler, and, from Lotze's suggestion of a world of being and of values, he offers as his own scheme the division of consciousness into a '*Vorstellungs* and *Wertungsseite.*' To the former belongs the *Was* of our consciousness, to the latter the *Wie.* The valuation side is characterized by a polarity of which the fundamental form is desire and aversion. This polarity is manifested in all three spheres of valuation, viz., in the emotional, the volitional and the logical. On the ideational side the subject matter is divided into material and syntheses. The material is sensorial or reproductive. Syntheses may be either *combinations* or *assimilations.*

With the discussion of inherited and acquired reactions the author first takes up his subject specifically. The chief point of interest here is his treatment, under inherited reactions, of instincts. His general point of view seems to be that of James, whom he quotes regarding man's numerous instincts. It is shown that reflexes vary widely in their significance for consciousness and volition. The vocal reflex is mentioned as typical of the class that is always more or less conscious and hence amenable to voluntary control. Nothing is said of the impulsive movements mentioned by Preyer, although reflexes of the type mentioned above certainly approach very closely true impulsive movements.

It is unnecessary here to go into the author's discussion of play. He discusses the various theories briefly and comments favorably upon the recent American study by Carr.

In general it may be said of his theory of instinct, that it is marked by much more common sense than belongs to many current discussions. He holds that when there are conscious concomitants it is better to use the term impulse than instinct. "At any rate we need this expression for a certain inherited manner of reaction whose character will not readily coincide with that of the concept of instinct, namely, the imitative impulse. In the case of instincts and reflexes, we pre-

suppose, in other words, definitely determined, inherited pathways in the nervous system, which on the appropriate stimulus produce in all individuals of a species a similar motor discharge. In the case of imitation, however, the motor reaction changes according to the nature of the copy, so that here we cannot rightly speak of inherited pathways which serve imitation" (pp. 42, 43). Imitation furnishes a means by which a no longer adequate instinct is supplemented or reconstructed. Its chief function is to enable the child to take up and assimilate the values of his predecessors. In general it gives one a more exact appreciation of the mental life of others. He quotes approvingly from Hirn's *Origins of Art*, 'As children we imitate all before we understand and through imitation we have learned to understand.'

As for acquired reactions, they depend in their development upon the laws of habit. It is to be regretted that he does not attempt any genetic analysis of the development of such forms of movement. It is true he mentions some six forms of reaction of varying stages of complexity from the mere physiological process, illustrated in reflexes, to the reaction involving logical valuation, illustrated in the selective grasping of the largest and ripest of offered fruits. But there is no indication of any method of development of one from the other. They are given as just so many fixed forms of action.

In the more strictly psychological portion of the work the author follows largely the subjects traditionally treated, in introductory treatises, aiming apparently rather to give a convenient résumé of previously accepted theories than to put forth any essentially new point of view. In this portion of the work entitled 'Reproduction,' are treated association of ideas, memory, imagination, assimilation, recognition, and illusions. Finally, under the head of 'Knowledge,' are discussed conception, judgment, and reasoning. It will thus be noted that even in his main subdivisions the classification proposed at the outset is not adhered to. It is true that the terms of the classification are frequently referred to, but they are certainly not the organizing ideas. It is especially noteworthy also that the most genuinely genetic portion of the work, namely, the portion devoted to inherited and acquired reactions and the section on play, has no organic connection with his scheme of mental classification. Aside from this strictly genetic portion it seems to the reviewer that the book is not primarily what it claims to be, *i. e.*, a discussion of the mental life of the child, but rather an outline of some adult mental processes which can be illustrated from child life. We raise the question as to whether such a procedure can give us a true genetic psychology. Should our primary object be to find

simply examples in the child's experience of various types of association, of memory, of illusions, of reasoning, etc., or should it be to show the *place* of these processes in the child's unfolding mental life? If we are looking for analogues of adult processes in the child we are certainly not concerned with the psychology of his mental life *überhaupt*, but only of those portions that happen to fall readily into the adult mold. We do not mean to say that all of Groos' discussion is subject to this criticism, but certainly a large number of his references to children are of this external sort.

We shall not attempt to review his general psychological theory, but simply to refer to some of the points in which he touches genetic problems.

Under the head of 'Learning and Forgetting' he discusses various memory tests of the Ebbinghaus type and points out their obvious limitations when applied to children, that is, that they test the power of voluntary attention rather than actual strength of memory. The relation of memory to repetition and the comparative value of learning by parts or by taking a thing in its entirety is discussed and illustrated. The problem of the memory of the various senses is touched upon and illustrated by experiments in learning the spelling of words. We have next a section devoted to errors of memory. Their frequency with children is noted, and in this connection the phenomena of the suggestibility of children is discussed and the importance of recognizing it in questioning is pointed out. Next follows a general discussion of the constructive imagination and therewith of children's lies and stories of the explanatory myth type. Under apperception the author points out the importance of the natural interests and impulses as assimilative agencies in children. Bell's *A Study of the Teacher's Influence* is referred to as illustrating the character of the apperception of adolescence. The development of power to recognize familiar objects and persons is illustrated by examples from Miss Shinn, Preyer and others. The child is usually lacking in ability to distinguish between identity and mere sameness of species. His general deficiency in power of recognition accounts for many cases of childish fright. A characteristic instance of how loosely the author has worked out his subject is his reference at the end of this section to the joy exhibited by children at the recognition of familiar objects. It is simply stated as a fact with no attempt to analyze it or relate it to the general process of recognition. Next follows an interesting section on illusions. The interest of children in myths and fairy tales depends upon a sort of illusion analagous to the hallucination, while il-

lusions in the narrower sense are illustrated in the large class of games and plays that involve conscious self-deception. Of the value of this in the processes of growth present pedagogical practice has much to learn.

The book closes with brief sections on conception, judgment, and reasoning. Although much material from the literature of child-study is used, it is taken up not so much genetically as illustrative of more general psychological theory. As an instance of what we have in mind may be cited the stages of the development of the power to acquire knowledge (pp. 208–209). There is no doubt but that there is often such a progress from verbal memorizing through the acceptance of knowledge on authority up to the point where the student makes a truth his own through his own discriminative activity, but this is certainly not a true genetic treatment of the development of judgment. In the section on reasoning it is disappointing to find much space taken up with purely logical questions and so little devoted to a definite treatment of the development of reasoning power in the child.

The author shows considerable acquaintance with the child-study literature of America and illustrations are freely drawn from it, but they are unfortunately used largely in the external way that has been indicated.

Fundamentals of Child Study, a Discussion of Instincts and other Factors in Human Development with Practical Applications. EDWIN A. KIRKPATRICK, B.S., M.Ph. New York and London, Macmillan. 1903. Pp. xxi + 384.

Professor Kirkpatrick has given us, to say the least, a very readable book. Probably no work presents the general field of child study so fully and at the same time so conveniently as does his. After a discussion of the significance of infancy, he states as his problem 'the study of the outer and inner factors in human development' and the determination of 'how the inner are modified by the outer.' His seeming emphasis of external factors is reversed in the body of the work, where it is held that the development of instincts is of primary importance, and by this he apparently means the unfolding of inner factors according to laws of their own. Instinctive movements are taken as the basis for all differentiations of consciousness. Although his discussion is suggestive, one feels that he has not carried his analysis far enough. Consciousness develops, not from instincts as such, but from instincts that have fallen apart and hence needed readjustment. It is the more or less plastic character of the impulsive movements and the disintegrated instincts that renders possible the

acquisition of new movements, and it is the building up of new movements, as he rightly suggests, that 'makes conscious intelligence possible and useful' (p. 38). In other places he seems to adopt this view, as in the following: 'These spontaneous or random movements are very numerous in early life, and hence there is greater opportunity to select and perfect such of these chance movements as prove useful' (p. 56). 'As we have already seen, impulsive movements are the basis of voluntary control, since by no possibility can the mind know how to make a motion . . . until the motion has been made and the result experienced' (p. 86). On the other hand he says (p. 87): 'Our whole mental life, intellectual, emotional, and volitional, is developed from our instincts.'

One characteristic of the work which we cannot but feel is unfortunate is its tendency to analyze into more or less independent forms many varieties of action and many sets of mental phenomena and to leave them thus with no suggestion as to there being any genuine inner connection between them. It is of course desirable to analyze our material, but it is sometimes easier to see variety than underlying unity of process. This is certainly true in the case of the instincts. It may be proper to subdivide them indefinitely, but it is also greatly to be desired that we should have a notion of the psychological as well as the biological unity underneath such a set of phenomena. Our point is illustrated in the analysis here given of methods of learning. The varieties beginning with the simplest are as follows, (*a*) trial and success, (*b*) imitation, (*c*) by the understanding. It would have been suggestive to have shown that the last two methods are simply complicated varieties of the simpler trial-hit-and-miss form.

The development of the instincts and the order of their appearance is made the primary problem of child psychology (p. 44). It is assumed that there is a general parallelism between the appearance of instincts in the individual and in the race. The author points out, however, that the functional utility of instincts may cause wide divergence from the racial order (pp. 45, 46). The classification and general treatment of the instincts is practically identical with that of Marshall in his *Instinct and Reason*, *i. e.*, they are divided into individualistic, parental, social, adaptive, regulative, resultant, and miscellaneous. This classification amounts simply to an attempt to force all a child's activities into an instinctive mold. We can here offer only a general criticism of such a procedure. In the first place it necessitates an unwarranted extension of the term instinct. It is

difficult to conceive of an instinct as other than a relatively definite act dependent upon an equally specific modification of nerve structure. It is true that the supporters of such a theory as Professor Kirkpatrick's point out that even simple instincts do vary widely in expression, and hence that we are mistaken in holding that instincts are definitely fixed sets of movements. The fact of variation we grant, but we insist that as far as the *instinct* goes there *is* fixity. The overt action that we loosely call instinctive is not, however, the instinct but the resultant of the fixed tendency, of impulsive movements, and of the particular form of situation in which it must be expressed. In proportion as these two elements vary the actual expression of the instinct will of course be greatly modified. In the second place it seems to the reviewer that, even if the term can be taken in this extended sense, to apply it thus to the child is to remove his acts to a sphere in which a fruitful psychological analysis is impossible. When we have an act labeled as an instinct we have practically backed down from any attempt to deal with it psychologically, in other words admitted that we have reached an irreducible datum, concerning which the only problem is to state the time of its appearance. There is certainly nothing to hinder one's using any conceptual framework he chooses to interpret a given body of facts, provided of course that it adequately does it, but to apply instinct to play and curiosity, to imitative, religious, constructing, destroying, communicative, and adorning activities is to substitute words for analysis. At any rate we have only begun with them, not disposed of them. It is really immaterial what makes children have such and such impulses at certain times; we may assign them to instincts or what not.

Imitation, play, curiosity, religion, etc., are simply aspects of an unfolding process and should be stated in terms of it. To call them instincts is to tell nothing about them; we really know not whence are the springs of any of our acts, instinctive or not, but we do know that the organization of experience varies and hence conditions certain types of action. To locate a given act in its functional setting is to put ourselves in a direct relation to it that a statement in terms of instinct certainly does not permit. Whether this criticism is legitimate or not, one cannot but feel that the instincts are overdone when he reads the section on imitation. It is a sort of supplementary instinct to fill in where specific instincts are not provided (p. 131). It is conceived broadly enough to provide for all acts that do not fall readily into the before-mentioned instinctive molds. By means of the imitative instinct not only does 'nothing in his environment, physical

or social, escape the child' (p. 131), but as well it is operative whenever a child reproduces an act or word which he has observed, to gain some end (p. 132), or when he works toward an ideal (pp. 141, 142). Just how imitation is significant if it is to be applied to all activity is not apparent. It would be interesting to know whether there is any ultimate psychological difference between the various types of imitation, such as the reflex, spontaneous, dramatic, etc., or whether the classification is only an external or rough-and-ready one.

The remainder of the book is occupied chiefly with brief discussions of various problems regarding the development of intellect. Here also instinct appears to have an important *rôle*. "The chief difference between the intellect of the child and of the man, therefore, is that the child's actions are controlled largely by unconscious *instinctive* impulses and interests and the man's by unconscious habitual reactions and interests. The conscious intelligence of the man is not essentially different from that of the child, except that the extent of its activity is greater because of more numerous experiences, and its direction different because of other instinctive and developed interests. The problem of intellectual development is therefore simply one of determining the influence of instinctive tendencies upon its direction and vigor, and correlating these truths with all that is known of the effects of experience upon growth and intelligence" (p. 248). The author in this portion of the work discusses briefly the development of discrimination, the rate of mental activity, mental grasp, perception, imagination, conception, reasoning, etc. He here gathers together the results of various studies and supplements them with his own observations. The book closes with convenient summaries regarding heredity, individuality, abnormalities, and child study in schools. To each chapter are appended suggestive problems for farther study along the lines laid out and references to the literature of the topics treated. In criticizing the work as we have, we have not been unmindful of its many merits. A discriminating criticism of a book should cast on it more credit than the careless praise that is often easier written.

Education as Adjustment. M. V. O'Shea. New York, Longmans, Green and Company. 1903. Pp. xiv + 317.

The theory of education here worked out is based upon the conception of mind as functionally related to the needs of action. Education as adjustment means therefore such a training of the psychophysical organism as will make it most effective in dealing with the

concrete situations of life. Previous educational theory has compromised itself more or less by preconceptions, but there is a growing tendency in recent times to approach the problem in the unbiased way that the natural scientist does his concrete data. The author points out that there may be said to be as genuine a body of material on which to build a science of education as there was material for biological science fifty years ago.

The various aims of education are discussed, among others the 'doctrine of unfoldment,' that of 'formal discipline,' of 'acquisition,' and of 'utility.' It is shown that these are all more or less vague, or one-sided, and that the good aimed at by each is secured in the conception proposed by the author. He defines adjustment as 'a process of fitting things together; of getting them into harmony with each other; of so relating them that the intentions, as it were, of each may be realized and not thwarted by acting in opposition to one another. So, in order that this process may occur, the things concerned must of course bear an active relation toward each other' (p. 99). From this it will be seen that it is no mere static adjustment of the Spencerian sort that Dr. O'Shea has in mind. In its application to teaching 'adjustment seeks ever to give the individual mastery over those phases of the environment that he must understand in order to realize most fully the possibilities of his being' (p. 140). He argues very forcibly for the necessity of a specific training as over against the older theory that the powers of the mind could be cultivated in general out of all relation to their use in life.

The last portion of the book is devoted to a brief analysis of mental development from the view point of its being a process of adjustment as thus dynamically conceived. The development of the simplest reaction-systems is traced, as also that of certain notions such as cause and effect, location, means, etc. His discussion of curiosity is typical of his method in its happiest form. "To say that curiosity with reference to a certain thing disappears means that there is no longer difficulty in completing all the situations in which this thing enters — situations respecting its origin, its destiny, its whereabouts, its composition, its attributes, etc. Curiosity is just this effort of the organism to get situations completed. . . . There is doubtless born with the child a general tendency to look into everything, to explore the unknown, but it is questionable if this would amount to much if the experiences of the nursery had not shown him that it pays to keep on the *qui vive*. A child of six is not curious with respect to a complex situation if he has had no experience with it, or with something

akin to it" (p. 187). The child asks questions because in many cases "he is striving to have completed a situation one element of which is an agent acting, but the end to be attained is not apparent. He is impelled to seek this end, since all his experience has enforced upon him the idea that there is always an end to be attained — [and he] will not be satisfied until the general indefinite situation has become more definite and assured. When this is reached the questioning attitude ceases, of course" (p. 193).

The book contains much valuable material arranged from an interesting and suggestive point of view. If there is any error it is in the elaboration of the points of the argument with almost tedious detail. The conception of education as adjustment is itself somewhat external. The general result of a proper education may indeed be described as an adjustment in this dynamic sense, but when it is applied to the details of the school-room as a working aim it seems remote, or else it resolves itself into merely equipping children with certain given sets of tools that they will use in actual life. We certainly admit the desirability of this, but maintain further that the equipment must be accomplished in such a way that the pupil can go on doing it for himself. Then again, how is adjustment to be effected on the part of the child? Is it to be by merely learning a certain amount of information that he will need if he is to live adequately? Externally the process is one of adjustment, but internally it is a reorganization of experience with reference to its social values and with reference to the controlling of it. These are simply suggestions, however, since, as the author tells us, the detailed application is to be made in a volume shortly to appear.

The quotation of doggerel verse on page 148 ending in the line 'Ain't that so?' seems out of keeping.

L'éducation fondée sur la science. C. A. LAISANT. Préface d'Alfred Naquet. Paris, Félix Alcan. 1904. Pp. xlv + 153.

This volume contains chiefly four addresses by M. Laisant delivered at educational conferences held at intervals at the *Institut psycho-physiologique* in Paris from 1899 to 1903. The first address is an attempt to show how the principles of arithmetic, algebra and geometry may be taught in even primary classes through simple figures that will appeal to the eye. The futility of much of the current teaching is pointed out; graphic schemes are suggested for the teaching of the notion of number, simple geometrical relations and the

simpler propositions of the same. It may seem paradoxical to many, the author tells us, that 'these first principles may be assimilated with much less fatigue than the first notions of reading and writing. On one condition, however, that is, instead of persisting in the present system of elementary instruction, in place of giving a lesson bristling with formulas and rules, appealing only to the memory, creating fatigue and disgust,' we must work through the senses and images. The teaching must be absolutely concrete (p. 6). 'If there were an intelligent application of principles here pointed out, we should soon see a veritable revolution not only in primary teaching but also in secondary' (p. 31). The second conference is an appeal for the introduction of simple science into the primary grades. "The little child is easily affected with curiosity, is eager for facts and is well endowed to see and retain phenomena." The remainder of the book is taken up with a popular discussion of some more general educational problems for which the necessity of a thorough understanding of the psychology of childhood is emphasized. Physical education, coeducation, and aim of education are loosely strung together in the address.

The dominant note of the book is the importance of the scientific as over against the literary and classical in modern education. The study of Greek and Latin should be excluded, we are told, from all but the highest schools. "It would be monstrous according to my notion to pretend to continue giving to these languages the importance they have had in the past and which is accorded them to-day." As to the notion that Latin is essential for the understanding of French, he says, 'This is as reasonable as if, in order to produce solid biceps in a man, it were regarded as indispensable that he should exercise himself throughout his entire youth by carrying about a chair balanced on the end of his nose' (p. 110).

Esquisse d'une éducation de la mémoire. J. J. Van Biervliet. Paris, 1903. Pp. 126.

This monograph is occupied primarily with the problem of turning the results of the experimental study of the memory to account in the school-room. The simple and well-known methods of determining the predominant type of memory in individuals and in classes are given and explained. The relative strength of the memory of different people may be determined by the number of nonsense syllables each one can recall at a stated interval after having seen them from ten to fifteen seconds. Starting with a number sufficiently small for

even the weakest to be able to retain them, the syllables are gradually increased and the ability of each scholar is measured by the number of syllables correctly recalled. Pertinent suggestions are offered as to the conduct of the test that accuracy and reliability of result may be insured.

It is pointed out that the tests that have been made on school children show only an insignificant progress in memory through the school years, and the author is of the opinion that if there were some systematic attempt to cultivate the memory as such great good would result. The conditions of rapid memorizing should be borne in mind by the teacher. Experiments prove that attention and interest are of more value than mere repetition; the coöperation of two or more senses in fixing the images of the words to be memorized produces much better results than where only one is concerned, motor imagery still further facilitates the process, *e. g.*, in learning lists of words one is greatly assisted if he articulates them.

For the general cultivation of the memory, the pupils should have from ten to fifteen minutes exercise in the early portion of school-day in a rapid drill in nonsense syllables, both by eye and ear. Finally he argues for the use of some simple mnemonic system in the learning of dates and disconnected words or any series of words having little logical connection. The point of the author is that by some such painstaking procedure the power of memory can be greatly strengthened, especially through the use of the principles thus learned in the regular memory work needed in the regular school studies.

We should certainly question whether it is really the memory that is cultivated by these exercises or rather skill in the fixation of attention. Memory is certainly not a general something to be cultivated, but a power as diverse as the lines of human activity, and it can scarcely be cultivated outside of the setting in the action that has rendered its appearance necessary. The fact that students of twenty show little superiority over children of eight in nonsense-syllable tests proves that the power of memory is unchanged only as far as that relatively abstract test goes. The ordinary adult has a specialized memory for his special work. It would be difficult to prove by any test that it is better or worse than a child's. The exercises suggested by M. Biervliet would no doubt lead to good results, but because of the training of the attention that they afford and their furnishing of an economic method which could be applied in specific lines by the individual pupils and students.

Educational Psychology. EDWARD L. THORNDIKE. New York, Lemcke and Buechner. 1903. Pp. viii + 177.

With the aim of this work every educator will certainly be in the most hearty accord. "The work of education," the author tells us, "is to make changes in the human minds and bodies. To control these changes we need knowledge of the causes which bring them to pass. Such knowledge necessitates some means of measuring mental and bodily conditions; adequate knowledge necessitates accurate and complete measurements. We do all make measurements of mental as well as of bodily conditions, but commonly our measurements of mental conditions and so of the changes due to any educational endeavor are crude, individual and incomplete" (p. 3). The book therefore represents an effort to illustrate how mental capacities or traits of all kinds can be measured with a view to finding their quantitative value, their distribution, their relations to one another, whether they are original or acquired; how influenced by environment, selection, age, sex, etc. It is abundantly supplied with figures and tables illustrative of the application of accurate statistical methods to such data as are available. This is not the place to discuss the method as such. The limits of its availability for dealing with the phenomena of consciousness can be determined only by just such studies as these. It is only as we use it as fully as possible in connection with the concrete problems of education that we can discover the extent to which it is useful and hence adequate. We shall here attempt to give only a few of the deductions made by the author in his studies.

In the measurement of a mental trait of groups the necessity of taking account of 'its center of gravity or the general tendency of the trait and its variability' is pointed out, as is also the necessity of accompanying all measurements of mental trait by a statement of their reliability. The results of studies in the distribution of mental traits bear out the hypothesis 'that the distribution of any mental trait in a homogeneous species undisturbed by selection is that given by the probability integral' (p. 19). Two interesting educational corollaries of this law are that 'small differences between individuals in the same species are far more common than larger ones' and 'within any one species there is no clear demarcation of ordinary from exceptional grades of ability' (p. 22). As to relationships between mental traits, the author judges from his abstract tests that they are "most noticeable by their absence or slight degree. The striking thing is the complete independence of different mental functions even

where to the abstract psychological thinker they have seemed nearly identical" (p. 28). His conclusion is 'that the mind is a host of highly particularized and independent abilities' (p. 39).

A knowledge of original nature and its place in the progress of life is educationally of importance because "it is wasteful to attempt to create and folly to pretend to create capacities and interests which are assured to an individual before he is born" (p. 44). The influence of the environment is discussed through Dr. Rice's well-known studies of the influence of various environmental factors upon the efficiency in spelling and arithmetic. The complexity of the general problem is clearly pointed out and presents an admirable example of the logic of evidence. The same is true of the treatment of the relation between original and acquired traits, and of his treatment of many of the popular notions of sex differences in mental traits.

The chapter on exceptional children offers chiefly suggestions as to the nature of the problems involved in the study of very bright or very dull children. Under the heading of 'Broader Studies of Human Nature' is presented a drastic and, to the reviewer's mind, unanswerable criticism of the questionary method of gathering data for a scientific psychology. The book closes with a few suggestions upon education as a science. The business of education is to work changes in countless individuals possessing countless variations in their congeries of inherited and acquired traits. There is therefore no such thing as a general educational theory that is true and at the same time definite enough to be of any value. "It is the vice or the misfortune of thinkers about education to have chosen the methods of philosophy or of popular thought instead of those of science. We ruminate over the ideas of Pestalozzi or Herbart or Froebel as if writing a book a hundred years ago proved a man inspired. * * * We discuss the outpourings of successful college presidents. * * * We are like chemists who should quarrel over the views of Paracelsus. * * * There is a plentiful lack of knowledge while opinions more and more abound. They are very often good of their kind but they are not science" (p. 164).

In the appendices are explanations of tests mentioned in the text; of the formulæ for measuring general tendency, variability, relationship, and reliability; and lastly suggestions for further studies of the kind described in the text.

We should all certainly agree with the author in his emphasis of the great need for exact science rather than opinion in education. His painstaking attempt to formulate the precise information that is

at present available will be of the greatest value for educational theory. Perhaps the most immediate good it will accomplish is the making clear of a method of collecting and interpreting data on all sorts of educational problems. It is only when the author departs from scientific statement and draws certain conclusions as to the nature of mind as a whole that many will demur. Like all scientific statements, these regarding mental traits are abstractions and they are perfectly legitimate abstractions. From the point of view of these measurements the mind may be said to be 'but the sum total of an individual's feelings and acts, of the connections between outside events and his responses thereto, and of the possibilities of having such feelings, acts and connections.' But it is certainly leaving scientific statement to conclude that the mind is *only* that. However isolable mental traits may be for purposes of measurement, it does not follow that the mind is simply their sum with the implication that there are really many consciousnesses all more or less insulated. These are situations in which we are impressed with the unitary aspect of our minds. Hence we should say that it is not 'only for convenience that we call one man more learned than another instead of giving concrete lists of the information possessed by each and striking averages from all the particulars.' "If we could make such adequate measurements exhaustively we could therefore describe a man's mind as so many units of that emotional tendency, so many of this sense power, and so on through a well-nigh interminable list of possible mental traits" (p. 3). This may or may not be theoretically possible, but it is not a legitimate deduction from the fact that mind to be measured must assume the form of isolable traits. In fine, it is legitimate to abstract and measure, but it is not legitimate to say that since this can be done therefore the mind is the sum of the abstractions.

IRVING KING.

PRATT INSTITUTE.

The Psychology of Child Development. IRVING KING. Introduction by JOHN DEWEY. Chicago University Press. 1903. Pp. xx + 265.

What Mr. King attempts to do in this volume is to impress upon students of child psychology the necessity (1) of regarding t e mind from the functional standpoint, and (2) of studying every act in its complete setting. In the first chapter he argues that adult and child psychology are altogether different, at least when considered from the functional point of view. The difference is primarily one of mental organization; the infant's experience is wholly undifferentiated. Sev-

eral chapters are then devoted to showing that development consists in continual differentiation of experience. After this, 'Inhibition in Development' is discussed; also 'Imitation,' 'Moral Ideas of Childhood,' 'The Theory and Development of Interests' and 'Adolescence.' In a concluding chapter certain 'Educational Implications of Mental Development' are pointed out.

To my mind, the chief value of Mr. King's book lies in the emphasis he puts upon the study of the child-mind from the functional point of view, and as a unity instead of in disjointed and fragmentary bits. Doubtless many of the studies that have been made upon children during the past decade have presented us with isolated facts only, and it has been impossible to see them in their original connections, and so to determine what they mean, why they have occurred, and what they lead toward. From such data we cannot hope to gain much enlightenment respecting the fundamental processes in mental development.

Mr. King's criticism of *externality* in the study of mental development ought to do good. It should lead some very active child study men to try to determine the setting of the facts they gather, and especially to discover what experiences have called them forth. But I cannot myself feel as pessimistic about the present state of affairs as Mr. King does. He is chiefly negative in his book, finding fault with practically all that has been done, except, strangely enough, in the study of 'Interests.' Many of these latter studies have been made according to the method of externality which he condemns. Take, for instance, Children's Ambitions, that have been investigated by a number of individuals. Usually children have been required to answer some such question as, 'what would you like to do when you become a man?' Now the data gained from these questions lack altogether the setting to which Mr. King attaches so much importance. When the statistics are handed in they are not accompanied by any account of what events have gone before the answers, what the general attitude of the child toward the world is at the time, and what are the succeeding events. All one gets is an infinitesimal part of the child's mind at the moment.

While appreciating the soundness of Mr. King's general propositions, I find myself asking some questions regarding the way he has applied the method he praises. He argues that what we must do is to determine how the child evaluates his own actions, and not put our own interpretation upon his reasons for his conduct. But when he comes to discuss consciousness in the child all of his interpretations

are made from the adult standpoint. To be consistent he would have to do this, for he maintains that one cannot infer anything about the child's consciousness from particular acts; all one can say is that as activities grow more complex differentiation of consciousness must go on *pari passu* (p. 38). But if we cannot infer states and conditions of consciousness from what the child does, then how can we get a child psychology? The only resort is to infer that characteristic conscious processes in the child are connected with particular activities and expressions because we find such a relationship in our own consciousness; and this is the method Mr. King denounces.

But according to the author, any particular expression in the child may not be connected with the conscious process that a similar expression is in the adult. For in the child any stimulus is likely to produce reaction along the lines of least resistance at the moment. The same stimulus may at one time produce an expression of joy, at another time fear, at another time anger, and so on (p. 59). The mother's face may at this moment produce a joyful response, and at the next moment an angry response. To infer, then, when the child looks angry that he is angry would be certain to lead one astray often.

If it be true that the child's expressions at any period are no certain indications of his conscious processes, then I should think we had best give up talking about these processes. The author gets out of the difficulty by defining consciousness from the adult standpoint, and then applying the conception to the child. Mr. King makes me feel that, following his method, he could have written most of his book without ever having seen children. Take the general conception that development involves continual differentiation in consciousness, emotion, and all mental function, and you have the whole thing.

Now this is a good conception, but I cannot see that we are likely to get a great distance with it alone. I doubt if it will explain all the phenomena of mental development. Is it not possible that there may be mental functions at one period that disappear altogether in the process of development? They are either replaced by other functions, or are so transformed that the term *differentiated* will not apply to them. Then we need particulars; we need to know what the differentiations are at particular epochs. We need to know whether the differentiated thing at any moment is manifested toward all situations whatsoever, or only toward certain ones. But we must take Mr. King at his word. He aims to give simply a *point of view*, and not to give us any detailed account of mental development. One will look in vain in his book for concrete phenomena of development.

I feel that while we have perhaps gone to excess in the externality of our studies upon children we are as likely to make progress along this route as along the route of internality, which Mr. King values so highly. I have little reverence for isolated facts, but yet I can see that if we get enough of them we are likely to discover that certain kinds of activity are characteristic of children at certain periods of development, and we will be more apt to hunt for the significance of any activity and to see it in its setting in the developmental series than if we remain satisfied with the quite general statement that development consists of continual differentiation, which we have faith is true, though we are not given any concrete evidence to show that it is so.

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PSYCHOLOGY AND PHILOSOPHY.

The Relation of Structural and Functional Psychology to Philosophy. JAMES R. ANGELL. Philosophical Review XII., 3, pp. 243–271.

There can exist no theoretical distinctions between philosophy and psychology when psychology is interpreted as at once both structural and functional. For the problems of psychology and of the normative sciences are not discrete, isolated questions; "they are irrepressible outgrowths from a central and basic problem which we have chosen to designate as the problem of the structure and function of consciousness." The distinction between philosophy and psychology is largely the outcome of the prevalent attempt to make psychological investigations after the manner of biological procedure, that is, to treat the mind as an organism from structural and functional standpoints, analogous to anatomical and physiological standpoints. 'That the biological idea of function is applicable in a general way to the life of consciousness is hardly open to question,' but it is necessary to emphasize the 'disparity between the psychological form of the structure concept and that current in biology.' First, it is important to recognize that consciousness viewed dynamically from within is unipolar; it is only when it is viewed retrospectively that it appears to be made up of unhomogeneous qualities among which are certain ones which seem to be elementary, that is, incapable of further analysis. These psychological elements differ however from the anatomical in that while the latter are spatial and relatively durable entities, the former are not spatial and, by general consent, are in a measure admitted to be artifacts.

Furthermore, it is significant that there has been not horough-going attempt to make two independent sciences along these lines (of structure and function), and it is also suggestive, beyond the mere fact of the imperfections of language, that terms widely used in the structural sense, as sensation, image, affection, are also employed with functional significance. For the implication is that structure and function are distinctions only as two phases of one fact. It is, for example, to hypostatize the sensation when, 'dissociating it from its particular surroundings, we regard it as a type of a relatively structural element for which specific function is a secondary and unimportant consideration.' Psychology can not, therefore, confine itself to merely structural problems. The question as to the make-up of consciousness, that is, as to what operations it performs, cannot be answered without showing how and why they are performed.

This gives the starting point for the discussion of the relations between psychology and the normative philosophical sciences. As evidence of their organic connection the author emphasizes the fact of the unchecked invasion of psychology into normative fields and *vice versa* the 'intrusion into psychological writings' of investigations which, dealing ostensibly with mental functions, 'trespass in reality upon the preserves of the normative philosophical sciences.' More concretely, this relation is shown from the modern philosophical standpoint which regards 'experience itself as a universe or system in which truth [or value] is ultimately synonymous with the effective, and in which error is not only identifiable with partiality and incompleteness but particularly with that form of inadequacy which issues in the failure of practice when conceived in its entirety.' Practice does not mean that which is merely externally practical; constructive thought is practice in its most intelligently creative and formative stage. Now if consciousness is really an efficient agent in the furtherance of the life activities of the organism, its value obviously lies in its cognitive and volitional and even in its emotional functions. "So a functional psychology must canvass the general processes at present termed cognitive, affective, conative. In this canvass the questions treated by the normative philosophical sciences under head of value [logic dealing with value of the knowledge process, ethics with value in conduct, and æsthetics with value in feeling] must arise because they are synonymous with the problems of effective functioning." Briefly, this relation may be said to hold of psychology in relation to epistemology and metaphysics. For if one follows persistently the problem of logic which arises in psychology, as to the validity of the knowl-

edge process and the method of attaining truth, he is led over to the epistemological problem as to the ultimate nature and warrant of knowledge. And the organic connection is true of metaphysics, since it is after all only a persistent attempt at the complete rationalization of thought and conduct.

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Esquisse d'un Système de Psychologie Rationnelle. Leçons de Psychologie. EMILE LUBAC. Préface de M. HENRI BERGSON. Paris, Félix Alcan, 1904.

As the title implies, this book is the sketch of a system of psychology rather than an elaborated system, and the subtitle shows it to be an elementary text-book. The writer, a pupil of Bergson, is dissatisfied with the traditional empirical psychology with its machinery of association. For social convenience empirical psychology has constructed a conventional picture of mental life which is not recognizable by the subject it seeks to portray. For a true account we must turn to our feeling, or 'intuition,' of the living experience, from which standpoint we may obtain a view which is not only true but equally clear.

The author adopts the traditional classification of intellect, feeling (affection) and will. In general his plan is to show that over against the physiological factors, or the effects of experience, there is in every phase of mental life a factor representing pure mental activity, or reason. The perception of objects is not merely the projection outward of sensations but rather a process of differentiation of subject and object in which we arrive at a consciousness of self. Memory includes the physiological factor of habit but also the purely psychical factor of recognition. Association by contiguity is a repetition of experience, but association by similarity is purely spontaneous and original. In attention the psychical factor is shown in that concentration of thought which results in clearness as opposed to mere habits of fixation or the 'obsession' of fixed ideas. And will represents a factor distinct from the conflicting desires.

In criticism it must be said that the author's ideas have been in the main anticipated and more completely elaborated in our own psychological literature. The alternative to the mechanical psychology has been quite extensively elaborated by our English pragmatic school. And in comparison with these developments M. Lubac's results must be regarded as largely negative. His analysis is often acute and suggestive, and his distinctions as far as they go are clear. But his 'system' amounts to little more than showing that in every case there is

something more than the discernible physiological elements. What more is not clearly stated. On the whole this intuitional psychology has reached about the same point as our now somewhat out-of-date intuitional ethics. It is simply anti-mechanical.

WARNER FITE.

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A History of the Problems of Philosophy. PAUL JANET and GABRIEL SÉAILLES. Translated by ADA MONAHAN. Edited by HENRY JONES. Vol. I., pp. xviii + 380, Vol. II., pp. xii + 375. London, Macmillan and Co. 1902.

Almost all that need be said of this book in a short and somewhat belated notice is indicated in the authors' preface and in Professor Jones's admirable introduction. It is not a history of philosophy in the ordinary sense, but a history of philosophical problems; and it is, as the authors claim, 'conceived on an entirely new plan.' "We have taken, one after another, in their dogmatic order, the great problems of philosophy, and given their history, indicating their origin, their various aspects and forms, and the stage they have reached in our own day." Though Windelband's *History* will immediately occur to the reader, the authors' claim to originality of method is entirely valid, since, as Professor Jones remarks, Windelband's plan is essentially different. One point of difference may be mentioned: Windelband refers only occasionally to the philosophers' own expositions, while one of the characteristics of the work before us is the endeavor to introduce the student to the original sources through the medium of copious quotations in their best English renderings. Less valid than the claim to novelty of conception is the claim to have noted the present aspect of the great problems of philosophy. Thus in the sphere of psychology, the work of genetic and comparative psychologists like Romanes and Lloyd Morgan is not referred to, and the important contributions of social psychologists like Baldwin and Tarde are ignored. The chapter on Habit, for instance — to name no other — which closes with the views of Mill and Spencer, cannot be said to bring the various aspects of the problem down to date. And if it be true that the present *status* of psychological problems is imperfectly indicated, the same thing is true, as one would naturally expect, of ethics and metaphysics; since the present-day aspect of ethical and metaphysical questions has been largely determined by recent psychology. In illustration of this, I venture the assertion that one of the most marked characteristics of the two notable metaphysical works recently produced in this country — Royce's *Gifford Lectures* and

Ormond's *Foundations of Knowledge* — is the way in which their authors have worked the results of recent genetic psychology into the bone and fiber of their metaphysical thinking. This gratuitous comment is of course not meant as a criticism of the work before us. It is made merely for the purpose of pointing out that the 'aujourd'hui' in the sentence quoted, besides possessing more or less elasticity, must in any case refer to the date of the publication of the second French edition from which the present translation is made, viz., 1894. And moreover, it would be quite impossible in a work of modest compass, which traces the history of problems from Thales down, to include also a conspectus of current movements in philosophy.

As M. Séailles reminds us (XIX.) the book must be judged by what it pretends to be. It is designed as a text-book for students, with the object of introducing them to the study of philosophy and its history; but whether it is intended to be used by itself as an introduction to philosophy, or as a book for collateral reading and reference, is not stated, though we gather from the preface to the French edition that it is intended for use in connection with Janet's *Traité élémentaire de philosophie*. My own judgment is that for purposes of reference and collateral reading it may prove exceedingly useful, but that to employ it to advantage as a class-book would be difficult. As an introduction to the study of philosophy it can scarcely take the place of the old-fashioned histories or of theoretical introductions like those of Paulsen and Wundt. It will show the student how certain problems arose, what they are, and how they have been solved; but it will neither state nor attempt to solve some of the problems of contemporary philosophy, nor does its plan permit of that rounded presentation of an author's system which we expect to find in the general histories. It should be valuable to the student as affording a clear, scholarly and fairly objective historical account of certain problems; but in order to accomplish its full purpose, the chapters on the history of particular problems would have to be read in connection with discussions of these topics in standard works of recent date.

The contents of the book are as follows: Volume I. is devoted to psychology and contains chapters on 'What is Philosophy?' 'The Psychological Problem,' 'The Senses and External Perception,' 'Reason,' 'Memory,' 'The Association of Ideas,' 'Language,' 'The Feelings,' 'Freedom,' and 'Habit.' Volume II. is divided into three parts, dealing respectively with 'Ethics,' 'Metaphysics,' and 'Theodicy.' In Part III., 'Metaphysics,' the topics dealt with are 'Skepticism and Certitude, 'Matter,' 'Mind,' and 'The Relations between

Matter and Mind.' But in Parts II. and IV. the topical arrangement is abandoned for an historical one. Thus Part II., 'Ethics,' treats of (1) 'The Ethical Problem in Ancient Times,' and (2) 'The Ethical Problem in Modern Times.' Part IV., in like manner, treats of 'The Religious Problem in Ancient and in Modern Times.'

One need not quarrel with this distribution of material, which perhaps serves the authors' purpose as well as any other would; though it lacks consistency. There seems to be no clear conception of the mutual relations between the different philosophical disciplines, and the principle of distribution is neither a logical nor the traditional one. Where, *e. g.*, does the problem of knowledge belong? If under metaphysics, it is also true that the religious problem is metaphysical in character. Philosophy would then have two main divisions, psychology and metaphysics. (Cf. I., 25.) But then, where do ethics and logic come in, not to say æsthetics, of which there is no mention? In the French edition there is quite an extensive treatment of logic, which is omitted from the translation for lack of space and also because its place is already filled by other works accessible in English. The history of Ethics is included both on account of its excellence and of the poverty of the literature of the subject in our language. While I cannot agree with Professor Jones in regard to the exceptional poverty of our literature on this subject, I concur in his judgment that these chapters deserve a place in the English edition; and I may use the chapter on 'The Ethical Problem in Modern Times' to illustrate the scope, both by way of inclusion and omission, of the authors' accomplishment, since the chapters on Ethics may be taken as fairly typical of the character of the work as a whole.

The modern moralists, then, whose views are given, are Des-Cartes, Malbranche, Spinoza, Leibnitz, Hobbes and Helvetius (brief treatment), Kant, Bentham, Adam Smith, Mill and Spencer. It is at once apparent that the list is very incomplete, no mention being made of Fichte, Hegel, or Schopenhauer among German moralists, nor, among British writers, of Bain, Sidgwick, Stephen, T. H. Green — to name only these, whose works appeared some twenty years ago. An account of post-Kantian ethics which jumps from Kant to Adam Smith and Bentham and then to Mill and Spencer, aside from its obvious incompleteness, is apt to give a false impression of current tendencies. One other example may be given to illustrate Professor Jones's generalization, to be mentioned presently. In the chapter on Freedom, in addition to the great names in philosophy, place is found for Bossuet, but there is no mention of the classic

treatises of Collins and Edwards; and while these names cannot be included among philosophers of the first rank, a history of the problem of human freedom is scarcely complete without them. In fact, the features most likely to be commented upon are some notable omissions and the relative emphasis laid upon the different systems and tendencies. As Professor Jones points out, the story of German philosophy since Kant is very imperfectly told (there is, *e. g.*, the barest reference to Schopenhauer and no mention at all of Lotze), while in England the whole idealistic movement is ignored. From the frequency with which the chapters close with Herbert Spencer, the French student would certainly conclude that Spencer is still not merely 'our great philosopher,' but our only philosopher since Mill. This imperfect presentation of British philosophy is a less serious defect for the English reader than for the students to whom the original work is addressed, since the former can more readily supply the deficiencies from his own knowledge, while the French student is in danger of receiving the impression that English philosophy is necessarily empirical. This edition, then, should be in some respects more valuable than the original, since it enables the English reader to view the development of philosophical problems through French spectacles, without the danger, to which the French student is exposed, of getting a false perspective. We are indebted to the editor and the translator for making it available in such excellent form to the English reader.

The chief merits of the book, as already implied, seem to me to be its novelty of conception and its clear, accurate and scholarly presentation of Greek philosopy, the Cartesian School and French philosophy generally, the English empiricists, and the Scottish School. Its principal defect is its incompleteness; though the reader will occasionally be disposed to criticise the author's expositions. Thus, *e. g.*, I think that the rationalistic element in Locke is overlooked and that his opposition to DesCartes is exaggerated and their affinities are ignored. Thus we are told (I., 112) that 'Locke begins by attacking DesCartes' doctrine of innate ideas.' But was it DesCartes' doctrine that Locke was attacking?

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ETHICS.

The Nature of Goodness. GEORGE HERBERT PALMER. Boston and New York, Houghton, Mifflin & Co. 1903. Pp. viii + 247.

This volume, which consists of lectures delivered before college audiences at several leading institutions, discusses in an effective and

interesting manner fundamental ethical problems. The argument is chiefly concerned with the highly ambiguous word "goodness." Those features of goodness which are common alike to persons and things are first examined, and then personal goodness.

Are we warranted in attributing goodness to things? In the sense of adaptation to an end — as when we speak of a good knife — doubtless; but can we characterize a physical object as good in the absolute sense, as having value in itself? Professor Palmer's answer to this question is indicated in these definitions: 'Intrinsic goodness is the expression of the fulness of function in the constitution of an organism'; an object is good in itself when its 'powers are so adjusted to one another that they coöperate to render the object a firm totality.' This implies that coherence of inner constitution may, independently of any relation to conscious beings, confer worth. Yet elsewhere we are told that 'in the last analysis the word good will be found everywhere to refer to some satisfaction of human desire.' Surely the latter statement is correct. A good implies a being capable of appreciation; in the absence of a responsive sensibility, no outward thing can have value. On what ground, then, can we speak of anything external as intrinsically good? Not on the ground of its perfection of structure and function, but only as it may minister to results in a rational and feeling consciousness that are intrinsically excellent. The Venus of Milo is good in itself because the sentiment of beauty which it awakens is an absolute end. In the realm of externalities, we deal for the most part with extrinsic goodness: food, clothing, houses, lands, mediate satisfactions that are subordinate and instrumental. But some outward objects are so correlated to our intellectual, æsthetic and ethical nature as to contribute directly to the fulfillment of our personality. These are not utilities, but have value in themselves. The argument of the first two chapters is perhaps open to criticism, as not recognizing with sufficient explicitness the essentially personal character of the category of goodness, and for this reason ascribing to things, apart from their relation to persons, the dignity of inherent worth.

The goodness of persons is considered in connection with the four elements into which personality may be analyzed — self-consciousness, self-direction, self-development, self-sacrifice. The first three of these are obviously coöperating factors, but the fourth suggests a difficulty. How is self-sacrifice to be reconciled with self-assertion? "We must acknowledge that self-sacrifice no less than culture is a powerful form of self-assertion. To say, 'I will sacrifice myself,' is to leave

the important part of the business unexpressed. The weighty matter is in the covert preposition *for*, — 'I will sacrifice myself *for*.' An approved object is aimed at. We are not primarily interested in negating ourselves. * * * Omit, or overlook, that word *for*, and self-sacrifice loses its exalted character. It sinks into asceticism." This solution of the problem does not destroy the reality of the sacrifice by assuming a compensating good different from the action itself, nor does it involve the anomaly of a diminished and impoverished self-hood; it affirms the all-important practical truth that legitimate self-denial is always, in the most real sense, self-affirmation.

The final chapter on 'the three stages of goodness' gives philosophic statement to the thought embodied in Wordsworth's 'Ode to Duty,' in Matthew Arnold's 'Morality,' in Christ's saying about becoming as little children in order to enter the kingdom of heaven. The ethical and pedagogic importance of a due appreciation of these stadia of moral experience — the goodness of nature, the goodness of reflection, the goodness of second nature — is well insisted upon.

Every reader will note with sympathy, and many with a keen sense of personal loss, the graceful and pathetic dedication.

EDWARD H. GRIFFIN.

THE JOHNS HOPKINS UNIVERSITY.

BOOKS RECEIVED FROM MARCH 7 TO APRIL 7.

Twentieth Annual Report of the Bureau of American Ethnology (1898–1899). J. W. POWELL. Washington, Govt. Printing Office, 1903. Pp. ccxxiv + 237. [Contains a richly illustrated paper on 'Aboriginal Pottery of the Eastern United States,' by W. H. Holmes.]

Neue Forschungen über den Marquis de Sade und seine Zeit. EUGEN DÜHREN. Berlin, Harrwitz, 1904. Pp. xxxii + 488. [A general going over of the history and literature of the topic of de Sade's work, with view to results for the history of morals.]

La Philosophie en Amérique depuis les origines jusqu'à nos jours (1607–1900). L. VAN BECELAERE. Introduction by JOSIAH ROYCE. New York, Eclectic Pub. Co., 1904. Pp. xvii + 180. [Dedicated to W. T. Harris, introduced by Josiah Royce, and authorized by R. P. Rouleau, S. Th. L., &c.]

Das idealistische Argument in der Kritik des Materialismus. W. WARTENBURG. Leipzig, Barth, 1904. Pp. 71. Mk. 1.60.

Grundzüge der allgemeinen Aesthetik. STEPHEN WITASEK. Leipzig, Barth, 1904. Pp. vii + 410. Mk. 4.

Medical Reports of the Sheppard and Enoch Pratt Hospital. Vol. I., No. 1. Baltimore, 1903. Pp. 176. [Articles reprinted from the *Amer. Jn. of Insanity.*]

What is a Species? E. B. POULTON. President's Address, Entomol. Soc. London. London, Clay, 1904. Pp. 48.

Essai sur l'origine da l'Intelligence humaine. A. KASARINOFF. Paris, Michalon, 1903. Pp. 32.

L'organismo vivente e la sua anima. A. CURCI. Catania, Chiavaro, 1904. Pp. 245. L. 3.

Fatigue. A. MOSSO. Translated by MARGARET DRUMMOND and W. B. DRUMMOND. New York, G. P. Putnam's Sons; London, Sonnenschein, 1904. Pp. xiv + 334.

NOTES AND NEWS.

THE following appointments have been made in the Johns Hopkins University: Professor of Experimental Psychology, George M. Stratton, Ph.D., of the University of California; Lecturer in Experimental Psychology (1904–5), Professor E. W. Scripture of Yale University and the Carnegie Institution; Lecturer in Optics and Logic, C. Ladd Franklin, Baltimore; Lecturer in Physiological Psychology, Clarence B. Farrar, M.D., of the Sheppard Hospital. Details of the courses for 1904–5 will appear in the announcement pages of the BULLETIN.

ANNOUNCEMENTS have reached us of the Sixth International Zoölogical Congress, to meet at Berne, August 14 to 19, 1904, under the presidency of Professor Th. Studer. (Address: Musée d'Histoire Naturelle, Berne, Switzerland.)

A LABORATORY for experimental psychology has been founded in the Istituto di Studi Superiori at Florence, under the direction of Professor De Sarlo.

DR. GUIDO VILLA has been charged with the duties of Professor in the University of Rome pending the appointment of a successor to the late Professor Labriola. Professor Villa's *Contemporary Psychology* has been translated into English, Spanish, French, and German.

THE *Index Philosophique* of MM. Vaschide and von Buschan, noticed in our last issue, is published by the *Revue de Philosophie*, the organ of the Société Philosophique de Louvain. From the same

source we are to expect the *Annuaire des Philosophes*, already announced in the pages of the REVIEW. We note that the other Catholic journal, the *Revue Néo-Scolastique*, continues its quarterly 'Sommaire Idéologique,' which is very carefully compiled.

DR. S. I. FRANZ, instructor in physiology at Dartmouth Medical College, has been appointed pathological physiologist and psychologist to McLean Hospital for the Insane, at Waverly, Mass., the appointment taking place April 1. He will investigate the abnormal physiological and psychological conditions in the insane, in addition to continuing researches on the functions of the cerebrum.

DR. GEORGE R. MONTGOMERY, Lecturer in Philosophy at Yale University, author of *The Place of Values* (1903), and translator of Leibniz' *Metaphysics* (2d ed. 1903), has accepted a call to the professorship of philosophy in Carleton College, at Northfield, Minn. He takes the place there of the Rev. Eugene W. Lyman, who, we learn through the press, has been called to the chair of systematic theology and apologetics in the Congregational Theological Seminary at Montreal.

WE understand that the Glenmore School of Philosophy, founded by the late Thomas Davidson, will be in session in August this year as usual, at Hurricane, N. Y., under the supervision of Dr. Stephen F. Weston. (Address: Antioch College, Yellow Springs, Ohio.)

THE section of Anthropology and Psychology of the New York Academy of Sciences held a meeting in conjunction with the New York Branch of the American Psychological Association on March 28. The afternoon session was held at the Psychological Laboratory of Columbia University; the evening session at the American Museum of Natural History.

PROFESSOR JAMES WARD has accepted an invitation to deliver the Phi Beta Kappa oration at the University of Iowa on June 14. Dr. Ward will not reach this country before June 1.

PROFESSOR G. STANLEY HALL and Professor J. Mark Baldwin are to lecture in the Summer School of the South at the University of Tennessee in July.

The following items are taken from the press:

DR. JOSEPH JASTROW, professor of psychology and logic at the University of Wisconsin, has sailed for Europe to be absent until the autumn.

DR. EDWARD COWLES has resigned the superintendency of the McLean Hospital, at Waverly, Mass.

DR. EMIL KRAEPELIN, of the University of Heidelberg, editor of *Psychologische Arbeiten*, has gone to the Dutch East Indies to study insanity among the natives.

PROFESSOR KUNO FISCHER, of Heidelberg, will not retire, as has been announced, but offers this summer four lectures a week on 'The History of Modern Philosophy.'

DR. TH. ZIEHEN, of Utrecht, has been called to the chair of psychiatry at Berlin vacated by the death of Dr. F. Jolly; he has been succeeded by Professor Karl Wernicke, of Breslau. We record also the death of the well-known psychiatrist, Hermann Emminghaus, formerly professor at Freiburg.

MR. JOHN I. JEGI, B.S. (Chicago, 1896), professor of psychology and physiology in the Milwaukee State Normal School, died at his home in Milwaukee on January 7. Besides his works on physiological topics he published a paper on 'A Comparative Study of Auditory and Visual Memory,' in the *University of Chicago Contributions to Philosophy*.

DR. G. DAWES HICKS has been appointed to the chair of moral philosophy in University College, London, made vacant by the resignation of Dr. James Sully.

AT the recent meeting of the Society for Psychical Research, it was announced that the sum of $30,000 had been collected for a scholarship, which it was hoped would be increased to $40,000. The English Society now numbers 832 members and the American society 530 members.

PROFESSOR TITCHENER'S *Outline of Psychology* has been translated into Russian and Italian, and his *Primer of Psychology* into Spanish. An Italian translation of the *Experimental Psychology* is now in progress.

CONTENTS OF MAGAZINES, JANUARY TO MARCH.

THE HIBBERT JOURNAL, II., 2. Progressive Catholicism and High Church Absolutism: *H. C. Corrance.* The Alleged Indifference of Laymen to Religion, I.: *Sir Oliver Lodge;* II.: *Sir Edward Russell;* III.: *J. H. Muirhead;* IV.: *The Editor.* The Gods as Embodiments of the Race-Memory: *Edward Carpenter.* The Evidence of Design in the Elements and Structure of the Cosmos: *Wm. Pepperrell Montague.* The New Point of View in Theology:

J. H. Beibitz. Sacrificial Communion in Greek Religion: *Lewis R. Farnell.* The Johannine Problem, II.; Direct Internal Evidence: *B. W. Bacon.* Zoroastrianism and Primitive Christianity, II. (Concluded): *James Moffatt.* Some Theological Aspects of the Iconoclastic Controversy: *Alice Gardner.* Discussions, etc.

JOURNAL OF NERVOUS AND MENTAL DISEASE, 31, 2. A Case of Chronic Internal Hydrocephalus in a Youth: *E. E. Southard and W. F. Roberts.* Senile Dementia: a Clinical Study of Two Hundred Cases with Particular Regard to Types of the Disease: *William Pickett.* A Case of Alexia: *Philip Zenner.* The Reflexes in Long Distance Runners: A Study of the Influence of Fatigue upon Certain Reflexes: *Philip Coombs Knapp and John Jenks Thomas.* Society Proceedings. Journals. Miscellany. Book Reviews. 31. 3. Is Epilepsy a Functional Disease? *M. Allen Starr.* A Cerebellar Tumor; operation; recovery: *Frank R. Fry.* Delirium Grave: A Critical Study, with Report of a Case with Autopsy: *William Broaddus Pritchard.* Paralysis Agitans: Some Clinical Observations Based on the Study of 219 Cases Seen at the Clinic of Professor M. Allen Starr: *T. Stuart Hart.* Society Proceedings, etc.

JOURNAL OF PHILOSOPHY, PSYCHOLOGY AND SCIENTIFIC METHODS, I., 1. The International Congress of Arts and Science: *Hugo Münsterberg.* The Religious Consciousness as Ontological: *George Trumbull Ladd.* Discussion. Some Points in Minor Logic: *Christine Ladd Franklin.* Societies, etc. Notes. I., 2. Concerning the Concept and Existence-Proofs of the Infinite: *C. J. Keyser.* Organic Images: *E. B. Titchener.* Cases of Double Consciousness: *M. Allen Starr.* Discussion. The Logic of History. *J. A. Leighton.* The Limitations of Minor Logic. *Editor of Science.* Reviews, Notes, etc. I., 3. Notes upon Logical Topics; I. A Classification of Contemporary Tendencies: *John Dewey.* The Necessity from a Standpoint of Scientific Method of a Reconstruction of the Ideas of the Psychical and the Physical: *H. Heath Bawden.* Discussion. Organic Images. *Wilfrid Lay.* Reviews, etc. I., 4. Accuracy of Perception of Verticality, and the Factors that Influence it: *E. B. Delabarre.* Recent Contributions to the Literature of Scholasticism: *William Turner.* Note on the Idea of a 'Moral Sense' in British Thought Prior to Shaftesbury: *James H. Tufts.* Discussion. Professor Pierce on Space Perception: *James H. Hyslop.* Reviews, etc.

UNIVERSITY OF NEBRASKA STUDIES, IV., 1. The Kinetic Theory of Economic Crises: *W. G. Langworthy Taylor.* Valid-

ity of the Ergograph as a Measure of Work Capacity: *Thaddeus L. Bolton and Eleonora T. Miller.*

REVUE DE L'ECOLE D'ANTHROPOLOGIE, XIV, 1. Indication des principales étapes de la phylogénie des hommes: *Pierre-G. Mahoudeau.* Note sur des graines de végétaux trouvées dans la brèche préhistorique de la grotte d'Engis (Belgique). (Avec 2 fig.): *Ernest Doudou.* Quelques observations sur les pièces recueillies par M. Doudou dans la deuxième grotte d'Engis. (Avec 10 fig.): *L. Capitan.* Cours d'antiquités américaines. XIV., 2. Les Stigmates anatomiques de la Dégénérescence Mentale: *Etienne Rabaud.* La Masculinité des Départements Méditerranéens: *A. Dumont.* Un Nouveau Type de Grattoir-Burin: *J. Labrie* (avec 4 figures).

ARCHIV FÜR SYSTEMATISCHE PHILOSOPHIE, X., 1. Auf wem ruht Kants Geist? (Eine Säkularbetrachtung): *Erich Adickes.* Anschauung und Beschreibung (Ein Beitrag zur Aesthetik): *Max Dessoir.* Der Stoff vom philosophischen Standpunkte: *J. N. Szuman.* Jahresbericht. (Literature of Logic, 1895–99): *Edmund Husserl.* Miscellany.

JOURNAL FÜR PSYCHOLOGIE UND NEUROLOGIE, II., 6. Beiträge zum Studium des Hirnstammes: *Warncke.* Kasuistische Mitteilungen zur Anwendung der Hypnose bei unheilbaren organischen Erkrankungen: *Pewnizki.* Referate.

JOURNAL OF COMPARATIVE NEUROLOGY AND PSYCHOLOGY, XIV., 1. The Relation of the Motor Endings on the Muscle of the Frog to Neighboring Structures: *John Gordon Wilson.* Space Perception of Tortoises: *Robert M. Yerkes.* A Note on the Significance of the Form and Contents of the Nucleus in the Spinal Ganglion Cells of the Fœtal Rat: *Shinkishi Hatai.* An Establishment of Association in Hermit Crabs, *Eupagurus longicarpus: E. G. Spaulding.* Editorial.

REVUE PHILOSOPHIQUE, 1904, 2. La Science Positive de la Morale (1er Article): *Cantecor.* Ascétisme et Mysticisme: Étude Psychologique: *Brenier de Montmorand.* Saint-Simon, Père du Positivisme (Fin): *G. Dumas.* Les Principes des Mathématiques: *G. Milhaud.* Analyses et Comptes Rendus. Revue des Périodiques étrangers. Livres Nouveaux.

BULLETIN DE LA SOCIÉTÉ FRANÇAISE DE PHILOSOPHIE, IV., 1. La morale comme technique indépendante: *M. Rauh.* (Thesis with discussion.) IV., 2. Les moments de la philosophie de Charles Renouvier: *M. Dauriac.* (Thesis with discussion.)